

Remember that collaboration is encouraged, but you must write up solutions in your own words. Style and clarity of exposition are important elements to be considered in your solutions.

1. page 125, number 1.
2. page 125, number 4.
3. page 125, number 6.
4. page 125, number 7.
5. page 131, number 5
6. page 132, number 7
7. page 132, number 11
8. Fix an arbitrary real number c . Show that that Lebesgue measure is invariant under translation by c . That is, if E is measurable, show that $c + E$ is measurable and $\lambda(E) = \lambda(c + E)$. Suggestion: define $\mu(F) = \lambda(c + F)$ when $c + F$ is measurable, and show that μ agrees with λ on intervals.
9. Prove the following Lemma: If $\varphi = \sum_{i=1}^n b_i \chi_{B_i}$ is a step function, and the sets B_i have finite measure but are not necessarily disjoint, then we still have $I(\varphi) = \sum_{i=1}^n b_i \mu^*(B_i)$.